



FEDERAL COMMUNICATIONS COMMISSION

[ET Docket No. 19-257; FCC 21-92; FRS 47677]

FCC Announces Two New Innovation Zones and Amends One Existing Innovation Zone for Program Experimental Licenses

AGENCY: Federal Communications Commission.

ACTION: Notice.

SUMMARY: In this document, the Federal Communications Commission (Commission) creates two new Innovation Zones for Program Experimental Licenses in designated areas in and nearby the campuses of North Carolina State University (NC State Innovation Zone) in Raleigh, NC and Northeastern University (Northeastern Innovation Zone) in Boston, MA and expands the geographical boundary of the previously established Innovation Zone in New York City.

ADDRESSES: Federal Communications Commission, 45 L Street NE, Washington, DC 20554.

FOR FURTHER INFORMATION CONTACT: Anthony Serafini, Office of Engineering and Technology, (202) 418-2456, Anthony.Serafini@fcc.gov or Ira Keltz, Office of Engineering and Technology, at (202) 418-0616, or Ira.Keltz@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's document, Public Notice, FCC 21-92, ET Docket No. 19-257, adopted on August 5, 2021 and released August 6, 2021. The full text of this document is available for public inspection and can be downloaded at: <https://www.fcc.gov/document/fcc-established-two-new-innovation-zones-boston-and-raleigh-0> or by using the search function for ET Docket No. 19-257 on the Commission's ECFS web page at www.fcc.gov/ecfs.

SYNOPSIS

1. The two new zones the Commission establishes herein are based on detailed proposals from the PAWR program. This program for new technology experimentation is funded by the National Science Foundation along with a consortium consisting of over thirty technology and telecommunications companies. According to PAWR, this program "... will enable experimental exploration of robust new wireless devices, communication techniques, networks,

systems, and services that will revolutionize the nation's wireless ecosystem, thereby enhancing broadband connectivity, leveraging the emerging Internet of Things (IoT), and sustaining US leadership and economic competitiveness for decades to come.” The Commission anticipates that the experimentation done at these zones may also materially improve understanding of opportunities for, and capabilities of, open, standards-based wireless networks. PAWR program testbeds are equipped for Open radio access networks (Open RAN) research and testing, and PAWR teams are actively engaged with the Open RAN development community.

2. These Innovation Zones will provide new capabilities and complement the existing Innovation Zones in Salt Lake City and New York City. More specifically, in Raleigh, North Carolina, PAWR is initiating AERPAW – Aerial Experimentation and Research Platform for Advanced Wireless. This project will create a city-scale platform to focus on new use cases for advanced wireless technologies that are emerging for unmanned aerial systems. AERPAW will focus on how cellular networks and advanced wireless technologies can enable beyond visual line-of-sight unmanned aerial systems to accelerate development, verification, and testing of transformative advances and breakthroughs in telecommunications, transportation, infrastructure monitoring, agriculture, and public safety. Notably, the AERPAW testbed will be the first platform to allow testing at scale of open 5G-and-beyond solutions in unmanned aerial system verticals.

3. At Northeastern University in Boston, Massachusetts, PAWR will be supporting the transition of the Defense Advanced Research Projects Agency's (DARPA) Colosseum network emulator to a shared platform that is usable by the research community. Colosseum, the world's largest wireless network emulator, was originally designed to support DARPA's Spectrum Collaboration Challenge. With the conclusion of that challenge, the larger research community will now be able to take advantage of Colosseum's unique capabilities, including the ability to emulate full-stack communications, and to support artificial intelligence and machine learning algorithms and hardware in the loop. This project is expected to bring academia, government, and industry researchers together to accelerate advancements in wireless networked systems including Open RAN.

4. Under a Program License, qualified institutions may conduct testing for multiple non-related experiments under a single authorization within a defined geographic area under control of the licensee and where the licensee has institutional processes to manage and oversee experiments. The Innovation Zone takes this concept a step further by effectively providing an extension of a Program License's authorized area of operation. Such licensees are permitted to operate within an Innovation Zone, under the parameters set for that particular Zone, without having to modify their licenses to cover the new location.

5. The Commission is using the Office of Engineering and Technology's (OET) Experimental Licensing System webpage to post the Innovation Zone designations and detail the guidelines the Commission has established for each particular zone – including the specific geographic area(s) the Commission has designated and applicable technical parameters, such as frequency bands and power limits. Those wishing to test in an Innovation Zone must meet the Program License eligibility requirements, hold an existing Program License and operate in accordance with the geographic areas and technical limits established for the Innovation Zone. Prior to operating in an Innovation Zone, details for each Program Licensee experiment will be posted to the FCC webpage as described below. This posting will implement the Program License rules procedures that require notification of intended operations so that all nearby licensees and federal users have full knowledge of operations in an area. Program licensees must still meet the timing requirements prescribed by the Commission's rules and agreements with other Federal agencies. Specifically, program licensees are required to wait 10-days prior to beginning tests on spectrum allocated exclusively for non-federal use and 15-days when using spectrum allocated for federal use including shared non-federal/federal use. Finally, as detailed below, the PAWR Project Office will serve as a frequency coordinator for these Innovation Zones; operation may not commence without prior coordinating through that office.

Innovation Zone Term

6. Both the NC State and Northeastern Innovation Zones are established for a period of five years from the release date of this public notice. The term may be renewed upon request at the end of this term.

Program License Registration within Innovation Zones

7. A program licensee will be required to indicate its call sign and identify the Innovation Zone(s) in which it intends to operate. A program licensee must operate within the parameters established for the Innovation Zone within which it intends to operate. It will provide specific technical data, a description of the experiment, and a stop buzzer contact person for posting on the appropriate Innovation Zone web page(s). Parties will use OET's Experimental Licensing System webpage to submit this information.

8. Program licensees must register on OET's Experimental Licensing System webpage under the respective Innovation Zone webpage at: <https://www.fcc.gov/els> prior to operation. The online registration process will provide a record of Program Licensees that indicate an intent to operate in each Innovation Zone. This registration process along with the required coordination process through the PAWR program office will provide an opportunity for incumbent licensees and federal spectrum users to be an integral part of any necessary compatibility evaluation. The website will further be useful to alert other program licensees and experimental licensees of nearby operations.

Innovation Zone Frequency Coordination

9. In addition to requesting to operate in an Innovation Zone, a Program Licensee must also coordinate its operations prior to commencing its tests. The PAWR Project Office will serve as the frequency/operations coordinator for the Innovation Zones established and/or modified herein (as well as the Salt Lake City Innovation Zone). In this role, the PAWR Project Office will offer non-discriminatory service to all interested Program Licensees to coordinate specific times and locations for each Program Licensee's operations to avoid interference to other spectrum users and between Program Licensees' tests. The frequency coordinator may act as a central clearinghouse to obtain consent from other potentially affected Commission licensees and/or federal spectrum users for Innovation Zone operations. Alternatively, Program Licensees may coordinate their own arrangements with these authorized spectrum users. In such cases, Program Licensees must still coordinate specific operations through the PAWR Project Office. Note that designating PAWR as the Innovation Zone frequency coordinator does not confer

operating authority on PAWR nor does it confer sole authority for PAWR to permit operations as Program Licensees must also register on OET's Innovation Zone Registration Webpage. Additionally, current Commission rules do not allow airborne use in certain bands including active as well as passive receive-only bands (e.g., 2495-2690 MHz and 3450-4000 MHz); therefore, Program Licensees that plan to engage in experimental operations involving airborne transmissions in any Innovation Zone must take extra care to coordinate such operations (potentially over distances much greater than that necessary for terrestrial experimental operations) to ensure that authorized users will not experience harmful interference.

10. Interested Program Licensees may contact Mari Silbey, PAWR Program Director, at mari.silbey@us-ignite.org.

North Carolina State University Innovation Zone

Location

11. The NC State Innovation Zone will encompass two separate areas and program licensees will be permitted to use either or both areas.

12. The first area encompasses approximately 10.5 square miles for testing over the NC State University campus, a suburban residential area and a rural research farm. This area is defined as the area roughly between the Western Boulevard at the northern boundary, south of the Lake Wheeler Agricultural Research Station at the southern boundary, Gorman Street on the western boundary and South Saunders Street on the eastern boundary. The boundary for this area is within the polygon defined by the following coordinates:

35° 46' 23.4" N, 78° 39' 12.7" W

35° 47' 06.3" N, 78° 41' 13.0" W

35° 45' 03.3" N, 78° 42' 42.2" W

35° 43' 21.1" N, 78° 42' 11.9" W

35° 42' 59.5" N, 78° 41' 16.8" W

35° 43' 01.5" N, 78° 40' 08.1" W

13. To minimize the risk of harmful interference to incumbent operations and avoid

areas where airborne operations may be restricted, PAWR states that their primary area for airborne transmissions within the larger Innovation Zone will be over approximately 3 square miles in the Lake Wheeler area in the southern portion of the Innovation Zone. This area is defined by the following coordinates:

35° 44' 29.9" N 78° 40' 20.0" W
 35° 44' 38.7" N 78° 41' 32.3" W
 35° 43' 58.3" N 78° 42' 22.0" W
 35° 43' 23.5" N 78° 42' 12.3" W
 35° 42' 59.5" N 78° 41' 16.8" W
 35° 43' 01.5" N 78° 40' 08.1" W

14. The second area of NC State Innovation Zone will extend into the Town of Cary, North Carolina and cover approximately 3 square miles. This area is anticipated to support four fixed towers with permanent wireless transceivers. The tower locations are yet to be determined, but will be restricted to ensure all testing is confined within the Innovation Zone as defined by the following coordinates:

35° 48' 32.49" N, 78° 47' 39.64" W
 35° 48' 30.14" N, 78° 45' 53.70" W
 35° 46' 16.16" N, 78° 45' 51.17" W
 35° 46' 19.55" N, 78° 47' 47.80" W

Technical Limits and Band Information:

Frequency Band	Type of operation	Allocation	Fixed Station Maximum EIRP (dBm)	Mobile Station Maximum EIRP (dBm)
617-634.5 MHz (DL)	Fixed	Non-federal	65	-
663-698 MHz (UL)	Mobile	Non-federal	-	20
907.5-912.5 MHz	Fixed & Mobile	Shared	65	20
1755-1760 MHz (UL)	Mobile	Shared	-	20
2155-2160 MHz (DL)	Fixed	Non-federal	65	-
2390-2483.5 MHz	Fixed & Mobile	Shared	65	20
2500-2690 MHz ^{1,2}	Fixed & Mobile	Non-federal	65	20
3550-3700 MHz ^{1,2,3}	Fixed & Mobile	Shared	65	20
3700-3980 MHz ^{1,2}	Mobile	Non-federal	-	20
5850-5925 MHz	Fixed & Mobile	Shared	65	20
5925-7125 MHz ²	Fixed & Mobile	Non-Federal	65	20

27.5-28.35 GHz	Fixed & Mobile	Non-federal	65	20
38.6-40.0 GHz	Fixed & Mobile	Non-federal	65	20

- ¹ Commission rules do not permit airborne use on all or portions of these bands.
- ² Any experimental use must be coordinated with authorized users and registered receive-only fixed satellite earth stations.
- ³ Operations must be coordinated with a spectrum access system administrator

Northeastern University Innovation Zone

Location

15. The Northeastern University Innovation Zone will encompass two separate areas and program licensees will be permitted to use either or both areas.

16. The first area is on Northeastern University's main campus in Boston, MA and will cover a triangular tract of approximately 0.8 square miles. This area is defined as the area roughly between 361 Huntington Avenue as the northern vertex, Carter Playground as the eastern vertex, and 860 Columbus avenue as the southern boundary. The coordinates for this area are:

Northwest: 42° 20' 24.00" N, 71° 05' 25.00" W

Southwest: 42° 20' 12.12" N, 71° 05' 16.22" W

Northeast: 42° 20' 20.33" N, 71° 05' 2.90" W

17. The second area of the Northeastern University Innovation Zone is on Northeastern University's satellite campus in Burlington, MA and will cover a polygon of approximately 0.9 square miles. This area is defined as the area west of Cambridge Street in Burlington MA and bordering Mary Cummings Park. The coordinates for this area are:

Northwest: 42° 28' 44.54" N, 71 11' 37.43" W

Northeast: 42° 28' 45.59" N, 71 11' 20.62" W

Northeast: 42° 28' 41.88" N, 71 11' 22.2" W

South: 42° 28' 37.67 N, 71 11' 32.64 W

Southwest: 42° 28' 38.89" N, 71 11' 38.83" W

Technical Limits and Band Information:

Frequency Band	Type of operation	Allocation	Fixed Station Maximum EIRP (dBm)	Mobile Station Maximum EIRP (dBm)
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746-787 MHz	Fixed and Mobile	Non-federal	10 W	100mW
880-960 MHz ^{1,2}	Fixed and Mobile	Non-federal	10 W	100mW
1920-2170 MHz	Fixed and Mobile	Non-federal	10 W	100mW
2305-2360 MHz ^{1,2,4}	Mobile	Non-federal	-	100mW
2500-2690 MHz ^{1,2}	Fixed and Mobile	Non-federal	10 W	100mW
3000-3100 MHz	Fixed and Mobile	Shared	10 W	100mW
3300-3600 MHz ^{1,2,3,4}	Fixed and Mobile	Federal	10 W	100mW
3700-3980 MHz ^{1,2}	Fixed and Mobile	Non-federal	1 W	100mW
4620-4990 MHz ^{1,2,4}	Fixed and Mobile	Shared	1 W	100mW
27-30 GHz	Fixed and Mobile	Non-federal	10 W	100mW
37-40 GHz ^{1,2,5}	Fixed and Mobile	Shared	10 W	100mW
71-86 GHz ^{4,5}	Fixed and Mobile	Shared	10 W	100mW
122.5-140 GHz ⁴	Fixed and Mobile	Shared	1 W	100mW
209-225 GHz ⁴	Fixed and Mobile	Shared	1 W	100mW
232-235 GHz	Fixed and Mobile	Shared	1 W	100mW
238-250 GHz ⁴	Fixed and Mobile	Shared	1 W	100mW
1-1.05 THz	Fixed	Shared	100 mW	-

¹ Commission rules do not permit airborne use on all or portions of these bands.

² Any experimental use must be coordinated with authorized users and registered receive-only fixed satellite earth stations.

³ Operations in the 3550-3600 MHz band must be coordinated with a spectrum access system administrator.

⁴ Note that this band includes frequency ranges covered by footnote US342; all practicable steps should be taken to protect radio astronomy operation, including sites near the Innovation Zone.

⁵ Operations in the 37-40 GHz band and in the 80-86 GHz band must be coordinated with the Haystack Observatory in Westford, MA.

New York City Innovation Zone

Location:

18. The New York City Innovation Zone is being modified to cover the three Columbia University and City College of New York campus areas and will be defined as the area contained within:

- W 116 St from the Hudson River to Morningside Avenue (Through Riverside and Morningside Parks and The Columbia University Campus).

- Morningside Ave from W 116 St to W 124 St.
- W 124 from Morningside Ave to St Nicholas Ave
- St Nicholas Ave from W 124 St to W 138 St
- W 138 from St. Nicholas Ave to Broadway (through St. Nicholas park and the CCNY campus)
- Broadway from W 138 St to W 133 St
- W 133 St from Broadway to the Hudson River (through the park).
- Hudson River from W 133 to W 116

Technical Limits and Band Information:

Frequency Band	Type of operation	Allocation	Maximum EIRP (dBm)
2500-2690 MHz	Fixed	Non-federal	20
3700-4200 MHz ¹	Mobile	Non-federal	20
5850-5925 MHz	Mobile	Shared	20
5925-7125 MHz	Fixed & Mobile	Non-federal	20
27.5-28.35 GHz	Fixed	Non-federal	40 ²
38.6-40.0 GHz	Fixed	Non-federal	40 ²

¹ Commission rules do not permit airborne use in this band. Any experimental use must be coordinated with authorized users and registered receive-only fixed satellite earth stations.

² These power limits are an increase from the previously permitted 20 dBm limit.

FEDERAL COMMUNICATIONS COMMISSION

(Authority: 47 U.S.C. 301-303; 47 CFR 5.1.)

Marlene Dortch,
Secretary.

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